

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
16 August 2001 (16.08.2001)

PCT

(10) International Publication Number
WO 01/59066 A3

- (51) International Patent Classification⁷: **C12N 15/10**
- (21) International Application Number: **PCT/US01/40091**
- (22) International Filing Date: **12 February 2001 (12.02.2001)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
60/181,630 10 February 2000 (10.02.2000) US
60/186,904 3 March 2000 (03.03.2000) US
60/197,851 14 April 2000 (14.04.2000) US
- (71) Applicant (*for all designated States except US*): **XEN-COR, INC.** [US/US]; 111 W. Lemon Avenue, Monrovia, CA 91016 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): **DAHIYAT, Bassil, I.** [US/US]; 4413 San Andreas Avenue, Los Angeles, CA 90065 (US).
- (74) Agent: **TRECARTIN, Richard, F.**; Flehr Hohbach Test Albritton & Herbert LLP, Suite 3400, 4 Embarcadero Center, San Francisco, CA 94111-4187 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*
- (88) Date of publication of the international search report:
11 April 2002
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

WO 01/59066 A3

(54) Title: **PROTEIN DESIGN AUTOMATION FOR PROTEIN LIBRARIES**

(57) Abstract: The invention relates to the use of protein design automation (PDA) to generate computationally prescreened secondary libraries of proteins, and to methods and compositions utilizing the libraries.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/40091

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|
| X | WO 98 47089 A (CALIFORNIA INSTITUTE OF TECHNOLOGY) 22 October 1998 (1998-10-22) page 6, line 26 - line 30 --- | 1 |
| X | WO 98 32845 A (BIOINVENT INTERNATIONAL AB) 30 July 1998 (1998-07-30) the whole document --- | 7,8 |
| X | WO 95 22625 A (AFFYMAX) 24 August 1995 (1995-08-24) the whole document --- | 7,8 |
| | --- -/-- --- | |

☒ Further documents are listed in the continuation of box C☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

23 January 2002

Date of mailing of the international search report

13/02/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Masturzo, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/40091

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| A | <p>B I DAHIYAT & S L MAYO: "De novo protein design: fully automated sequence selection" SCIENCE., vol. 278, no. 5335, 3 October 1997 (1997-10-03), pages 82-87, XP002188179 AAAS. LANCASTER, PA., US ISSN: 0036-8075 cited in the application the whole document</p> | 1-9 |
| A | <p>B I DAHIYAT & S L MAYO: "Protein design automation" PROTEIN SCIENCE., vol. 5, no. 5, May 1996 (1996-05), pages 895-903, XP002073372 CAMBRIDGE UNIVERSITY PRESS, CAMBRIDGE., GB ISSN: 0961-8368 cited in the application the whole document</p> | 1-9 |
| P,X | <p>WO 00 23564 A (XENCOR INC.) 27 April 2000 (2000-04-27) the whole document</p> | 1-9 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/US 01/40091

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|-------------------------------------------|---|---------------------|----------------------------|---------------------|
| WO 9847089 | A | 22-10-1998 | AU 6965498 A | 11-11-1998 |
| | | | EP 0974111 A1 | 26-01-2000 |
| | | | US 6188965 B1 | 13-02-2001 |
| | | | WO 9847089 A1 | 22-10-1998 |
| | | | US 6269312 B1 | 31-07-2001 |
| | | | US 2001032052 A1 | 18-10-2001 |
| | | | US 2001039480 A1 | 08-11-2001 |
| | | | US 2002004706 A1 | 10-01-2002 |
| WO 9832845 | A | 30-07-1998 | AU 5771898 A | 18-08-1998 |
| | | | EP 0988378 A1 | 29-03-2000 |
| | | | WO 9832845 A1 | 30-07-1998 |
| | | | JP 2001508660 T | 03-07-2001 |
| WO 9522625 | A | 24-08-1995 | US 5605793 A | 25-02-1997 |
| | | | AT 211761 T | 15-01-2002 |
| | | | AU 703264 B2 | 25-03-1999 |
| | | | AU 2971495 A | 04-09-1995 |
| | | | CA 2182393 A1 | 24-08-1995 |
| | | | CN 1145641 A | 19-03-1997 |
| | | | DE 752008 T1 | 05-04-2001 |
| | | | DE 934999 T1 | 05-04-2001 |
| | | | EP 1094108 A2 | 25-04-2001 |
| | | | EP 0752008 A1 | 08-01-1997 |
| | | | EP 0934999 A1 | 11-08-1999 |
| | | | JP 10500561 T | 20-01-1998 |
| | | | JP 2001057893 A | 06-03-2001 |
| | | | WO 9522625 A1 | 24-08-1995 |
| | | | US 6180406 B1 | 30-01-2001 |
| | | | US 6132970 A | 17-10-2000 |
| | | | US 6287861 B1 | 11-09-2001 |
| | | | US 6291242 B1 | 18-09-2001 |
| | | | US 6277638 B1 | 21-08-2001 |
| | | | US 6323030 B1 | 27-11-2001 |
| | | | US 6319713 B1 | 20-11-2001 |
| | | | US 6309883 B1 | 30-10-2001 |
| | | | US 6297053 B1 | 02-10-2001 |
| | | | US 5830721 A | 03-11-1998 |
| | | | US 5811238 A | 22-09-1998 |
| | | | US 6117679 A | 12-09-2000 |
| | | | US 5837458 A | 17-11-1998 |
| WO 0023564 | A | 27-04-2000 | AU 1119000 A | 08-05-2000 |
| | | | EP 1157093 A1 | 28-11-2001 |
| | | | WO 0023564 A2 | 27-04-2000 |